Google Code Jam '13 Round 1A Problem A - Bullseye

Time limit: 30.0s **Memory limit:** 1G

Maria has been hired by the Ghastly Chemicals Junkies (GCJ) company to help them manufacture **bullseyes**. A **bullseye** consists of a number of concentric rings (rings that are centered at the same point), and it usually represents an archery target. GCJ is interested in manufacturing black-and-white bullseyes.

Maria starts with t millilitres of black paint, which she will use to draw rings of thickness 1cm (one centimetre). A ring of thickness 1cm is the space between two concentric circles whose radii differ by 1cm.

Maria draws the first black ring around a white circle of radius r cm. Then she repeats the following process for as long as she has enough paint to do so:

1. Maria imagines a white ring of thickness 1cm around the last black ring.
2. Then she draws a new black ring of thickness 1cm around that white ring.

Note that each "white ring" is simply the space between two black rings.

The area of a disk with radius 1cm is π cm^2. One millilitre of paint is required to cover area π cm^2. What is the maximum number of black rings that Maria can draw? Please note that:

- Maria only draws complete rings. If the remaining paint is not enough to draw a complete black ring, she stops painting immediately.
- There will always be enough paint to draw at least one black ring.

Input Specification

The first line of the input gives the number of test cases, T. T test cases follow. Each test case consists of a line containing two space separated integers: r and t.

Output Specification

For each test case, output one line containing `Case #x: y`, where x is the case number (starting from 1) and y is the maximum number of black rings that Maria can draw.

Limits

Time limit: 30 seconds per test set.

Memory limit: 1 GB.

Small Dataset

$1 \leq T \leq 1000$.

$1 \leq r,\ t \leq 1000$.

Large Dataset

$1 \leq T \leq 6000$.

$1 \leq r \leq 10^{18}$.

$1 \leq t \leq 2 \times 10^{18}$.

Sample Input

```
5
1 9
1 10
3 40
1 1000000000000000000
10000000000000000 1000000000000000000
```

Sample Output

```
Case #1: 1
Case #2: 2
Case #3: 3
Case #4: 707106780
Case #5: 49
```